The role of dermatology in Kaposi sarcoma diagnosis across three regions in sub-Saharan Africa

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Kaposi sarcoma (KS) remains a highly incident and morbid cancer across sub-Saharan Africa (SSA).[1] KS diagnosis requires multidisciplinary coordination between dermatology, oncology, and HIV departments, which makes patients vulnerable to care coordination gaps.[2] Although KS diagnosis ideally requires skin biopsy followed by prompt pathologic confirmation, in resource-limited settings KS is often diagnosed clinically or subject to delays in pathologic diagnosis.[2, 3] To better understand the role of dermatology in KS diagnosis and multidisciplinary care coordination, we conducted chart reviews and site assessments to evaluate the care cascade of KS patients at three HIV primary care networks in Southern, Eastern, and Western Africa.

We evaluated the medical records of all adults ≥18 newly diagnosed with HIV-associated KS in Princess Marina Hospital (PMH) Botswana (2015-2017), Academic Model Providing Access to Healthcare (AMPATH) Kenya (2009-2012), and National Hospital Abuja (NHA) / University of Abuja Teaching Hospital (UATH) Nigeria (2009-2012). Across sites, KS severity at diagnosis was derived from the signs/symptoms recorded within 30 days of diagnosis using AIDS Clinical Trials Group (ACTG) criteria.[4] Authors performed site assessments for Botswana (VW, TR, SG), Kenya (DS, DM, NB, EF) and Nigeria (KI, VK, EJ), delineating biopsy types and referral patterns for patients with suspected KS.

There were 604 KS cases diagnosed at AMPATH Kenya between 2009-2012, 192 at PMH Botswana between 2015-2017, and 34 at NHA/UATH Nigeria between 2009-2012 (Supplemental Table 1). The majority presented with advanced T1 disease (59.1% in Kenya, 77.6% in Botswana, 55.9% in Nigeria). Patient referrals and biopsy modality differed across sites (Table 1). In Botswana 100% of patients with suspected KS had a punch biopsy performed by a dermatologist. In contrast, in Kenya 45.3% of patients had a punch biopsy by a dermatologist or oncologist, while in Nigeria 29.4% of patients had an excisional biopsy by a surgeon or dermatologist (Figure 1).

Partnerships between international sites and the hospitals in Botswana and Kenya facilitated free punch biopsy supplies. The Nigerian hospital represents the more typical biopsy model in SSA, where excisional biopsy is performed by a general surgeon or dermatologist.[2] Excisional biopsy may be warranted in certain cases; however, it is more expensive to the patient and the healthcare system, may delay diagnosis, and increases procedural risk.[2]

As a medically complex disease, HIV-associated KS requires care coordination between at least three departments: HIV, oncology, and dermatology. We identified facilitators such as punch biopsy usage, care coordination across departments, use of a single hospital identification number, international partnerships, and

task-shifting to make pathological KS diagnosis more accessible. Study limitations include reliance on retrospective data and inability to define reasons for diagnostic delays leading to advanced disease.

We describe three unique models integrating dermatologic care into HIV-associated KS diagnosis across Southern, Eastern, and Western Africa. With the majority of our KS patients being diagnosed with advanced KS, investments in improved access to dermatologic care at both the community and tertiary care level, inexpensive and rapid biopsy services, and investment into histopathology are needed to address these disparities.

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Table 1: Kaposi sarcoma care coordination by site.

	Princess Marina Hospital, Botswana	**AMPATH Kenya**	**National Hospital, Abuja, Nigeria**
Country-wide HIV prevalence*[5]	20.3%	4.7%	1.5%
Number of people living with HIV country-wide**[5]	350,000	1,400,000	1,800,000
Biopsy Provider	Dermatology	Trained oncology nurses, dermatology	Surgery, dermatology
Type of Biopsies	Punch biopsies	Punch biopsies	Excisional biopsies (Wedge biopsies). Rarely punch biopsies.
Percentage of KS cases biopsy proven	100%	45%	29%
Percentage of KS cases referred to oncology	100%	72%	32%
Most Common First Line Chemotherapy Agent	Paclitaxel[†] or bleomycin/vincristine	Bleomycin/vincristine	Paclitaxel
Chemotherapy delivery	Oncology department via four departments around the country	Oncology department at tertiary (Moi Teaching and Referral Hospital) or three outreach clinics	NHA: oncology Department UATH: HIV physicians working closely with the dermatology service
Oncology-HIV service coordination	Referral basis; oncology and dermatology provide HIV referrals as needed, single hospital medical record used across all clinics	Referral basis; HIV and oncology patient medical records are separate and unlinked	Referral basis and consults; single medical record used across all clinics
HIV-Dermatology service coordination	Weekly ID-dermatology clinic; patients can be referred for on the spot HIV testing from all dermatology clinics	Weekly HIV-dermatology clinic	Patients with suspected KS seen in dermatology clinic are referred to HIV clinic for testing
Dermatology-Oncology service coordination	Dermatology performs biopsies, starts staging work up and transfers care to oncology which continues work-up, treatment and long term follow-up	Oncology performs biopsies on suspected KS cases; if negative, refer to dermatology for clinical management	NHA: patients with KS referred to oncology which provides chemotherapy and long term follow-up

*All people ages 15-49 in 2018
**All people ages 15 and over in 2018
[†]Paclitaxel is preferential first line in Botswana, however is often unavailable

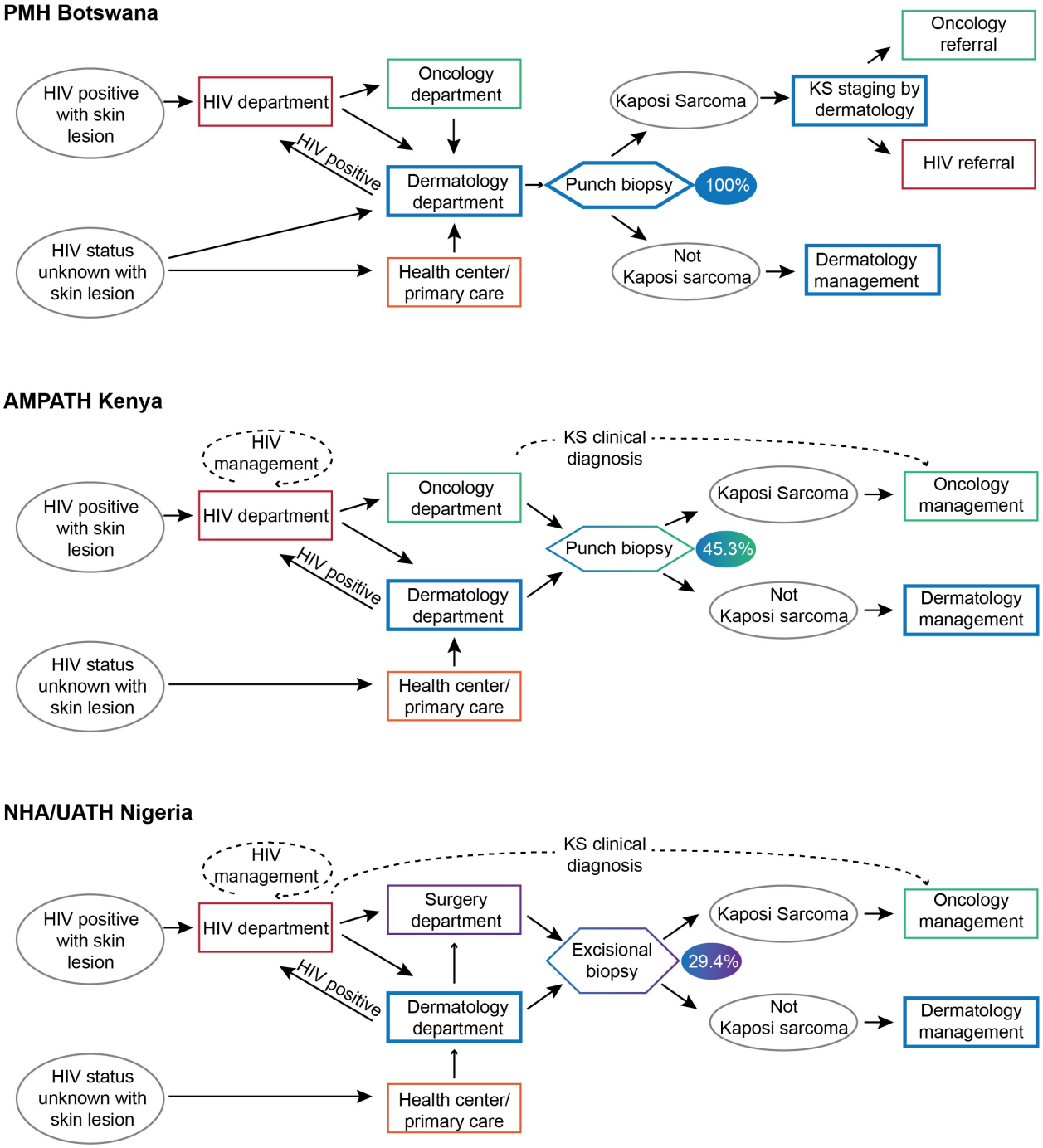

Figure 1: Process maps of pathway to KS Diagnosis for patients with suspicious skin lesions presenting at PMH Botswana, AMPATH Kenya and NHA/UATH Nigeria.